



A Marshall Cavendish Collection

EVERY FORTNIGHT

QUEST

ADVENTURES IN THE WORLD OF SCIENCE

LIFE FORCES

6



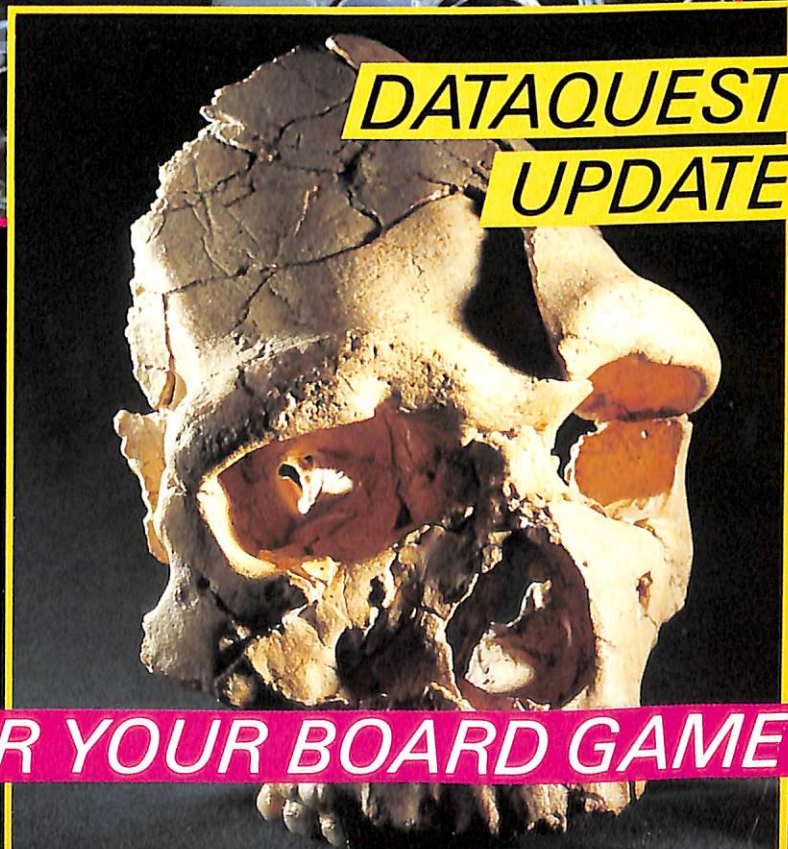
MAKE A MICROSCOPE

DINOSAUR POSTER

FACT FILES ON:

- ▶ The origins of life
- ▶ The very first cell
- ▶ From ape to Man
- ▶ Test-tube clones
- ▶ Life in outer space
- ▶ Threat to survival
- ▶ The Man machine

PLUS



DATAQUEST
UPDATE

MORE Q+A CARDS FOR YOUR BOARD GAME

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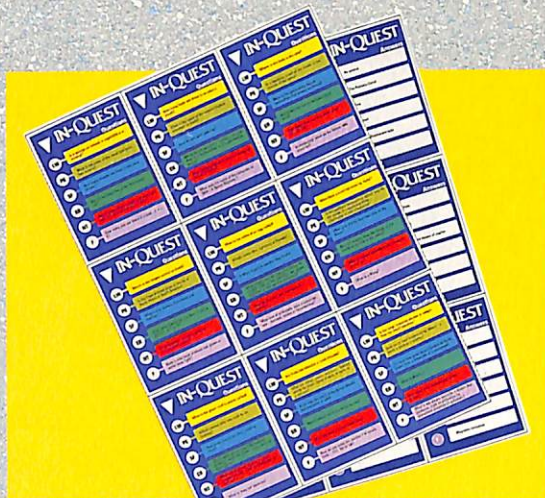




INSIDE THIS PACK

FACT FILES

- ▶ In the beginning
- ▶ From ape to Man
- ▶ Space homes
- ▶ Robots
- ▶ Living cells
- ▶ Clones
- ▶ Threats to life



In-Quest question and answer cards



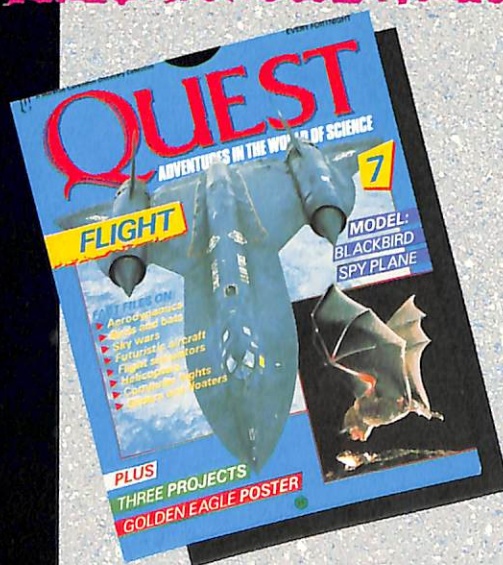
POSTER Pre-historic giants

PROJECT SHEET

- Make a microscope
- Cultivating life
- Greenhouse effect

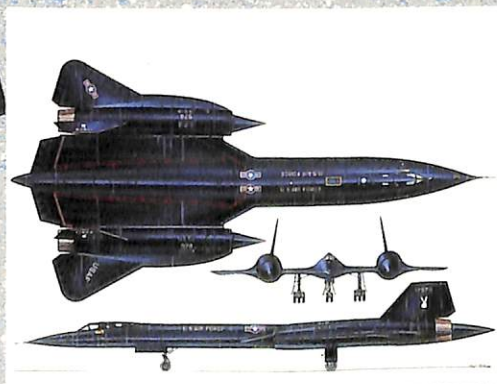


COMING IN QUEST 7 FLIGHT



FACT FILES INCLUDE:

- ▶ Missiles
- ▶ Flying computers
- ▶ Gliders
- ▶ Helicopters
- ▶ Birds and bats
- ▶ How planes fly
- ▶ Flight simulators



POSTER The Golden Eagle

Blackbird — American spy plane

MODEL

DATAQUEST

CITIES & COMMUNITIES: TALLEST BUILDINGS

Height (metres)	Storeys	Building	Location
443	110	Sears Tower	Chicago, USA
411	110	World Trade Center	New York City, USA
381	102	Empire State Building	New York City, USA
346	80	Standard Oil Amoco Building	Chicago, USA
344	100	John Hancock Center	Chicago, USA
310	73	First Interstate World Center	Los Angeles, USA
305	75	Texas Commercial Plaza	Houston, USA
305	73	Bank of China	Hong Kong
302	71	Allied Bank Plaza	Houston, USA
291	76	Columbia Center	Seattle, USA
288	64	Two Prudential Plaza	Chicago, USA
285	72	First Bank Tower	Toronto, Canada
281	72	Main Center	Dallas, USA
280	60	Overseas Union Bank	Singapore
279	46	Citicorp Center	New York City, USA
276	68	Scotia Square	Toronto, Canada
275	64	Transco Tower	Houston, USA
271	60	AT&T Corporate Center	Chicago, USA
267	68	900 North Michigan	Chicago, USA
265	65	311 S. Wacker	Chicago, USA
264	77	Chrysler Building	New York City, USA
262	74	Water Tower Plaza	Chicago, USA
261	62	United California Bank	Los Angeles, USA
259	66	United California Bank	New York City, USA
259	48	Transamerica Pyramid	San Francisco, USA

Lists of data relating to each of the Quest themes will be given as projects in every third issue.

LIFEFORCES: LIFESPANS

HIGHEST		LOWEST	
Max. (yrs)	Species	Max. (yrs)	Species
152	Marion's tortoise	7	Millipede
150	Quahog (clam)	6	House mouse
116	Spur-thighed tortoise	5	Segmented worm
115	Man	4	Moonrat
100	Deep-sea clam	3	Siberian flying squirrel
90	Killer whale	2	Pygmy white-toothed shrew
90	Sea anemone	1	Monarch butterfly
88	European eel	0.5	Bedbug
82	Lake sturgeon	0.27	Black widow spider
80	Freshwater mussel	0.04	Common housefly
79	Asiatic elephant		
77	Tuatara (reptile)		
72	Andean condor		
70	African elephant		

NOTIFIABLE OFFENCES RECORDED BY POLICE IN ENGLAND AND WALES

Type of offence	1986	1987	1988	1989	1990
Violence against the person	125.5	141	158.2	177	184.7
Sexual	22.7	25.2	26.5	29.7	29
Robbery and burglary	961.6	932.7	849.2	859.1	1,042.7
Theft	2,003.9	2,052	1,931.3	2,012.8	2,374
Fraud and forgery	133.4	133	133.9	134.5	147.9
Criminal damage	583.6	589	593.9	630.1	733.3
Other	16.7	19.3	22.7	27.6	31.1
TOTAL	3,847.4	3,892.2	3,715.7	3,870.8	4,542.7

(figures are in 1000s)

IN-QUEST

A GAME FOR TWO TO SIX PLAYERS

THE OBJECT OF THE GAME is to get all six of your counters on their matching marks in each of the six target areas (Futures, New Technology, Planet Earth, The Living World, Space Frontiers and Energy and Resources). Players move from circle to circle by answering questions correctly.

TO PLAY

Each player chooses how he wishes to travel to the target areas, and takes six counters of the same sort (either helicopters, jeeps, tanks, submarines, battleships or aircraft) and stacks them in the 'base' - the hexagonal area in the centre of the board.

Place the question cards in a container that does not allow you to see the questions or answers.

The first player (chosen at random) selects the target area - Futures, Space Frontiers etc - that he would like his first question from.

The player to his left picks the top card from the deck and asks the first player the question on his chosen target area. After checking the answer on the back, he returns the card to the bottom of the deck.

GETTING IT RIGHT

If the player answers correctly, he moves his counter - of the same colour as the target area chosen - out of base on to a matching coloured circle on the inner ring (i.e. if he answers a Futures question, he can move on to a purple circle). He then gets another turn.

If he again answers correctly, he can either move the same counter further towards the target area chosen, or move a second counter out of base towards another target area.

AT ANY ONE TIME, A PLAYER CAN ONLY HAVE TWO COUNTERS ON THE MOVE

If a player decides to move his first counter on, for this turn only, he has a choice of opting for the nearest coloured circle to his left or his right.

Once again, he is asked the corresponding question from the top card of the deck by the player on his left.

If he is right, he moves on to that coloured circle. He is then asked the question of the coloured circle ahead.

ANY PLAYER CAN HAVE ONLY THREE TURNS IN SUCCESSION

After three successful turns by any player, it is the turn of the player on his left.

GETTING IT WRONG

If ever a player gets an answer wrong, he remains in the same position, and the player to his left plays next.

CHALLENGING TACTICS

Any player can land on another player immediately ahead of him by asking for the question of the circle ahead. If he answers correctly, he moves on to that circle and the original 'occupant' must return to base.

If the challenging player answers incorrectly, he must return to base.

GETTING ON TARGET

To arrive at a target area, the player must answer the question of that category correctly. If he does not, he must return to base.

THE WINNER

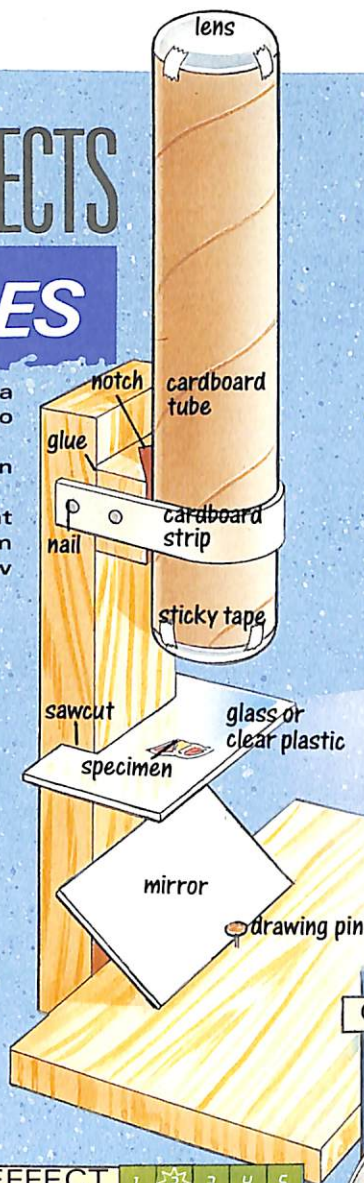
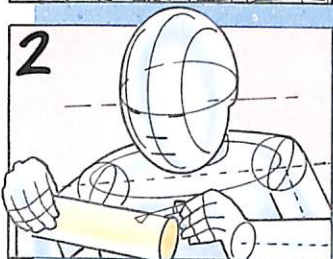
The first player to get his counters 'home' to all six target areas is the winner.



PROJECTS

LIFE FORCES

- How can you make a microscope using two magnifying glasses?
- What living cells lurk in your home?
- What effect that keeps the Earth warm can make seeds grow faster?



MAKE A MICROSCOPE

1 2 3 4 5

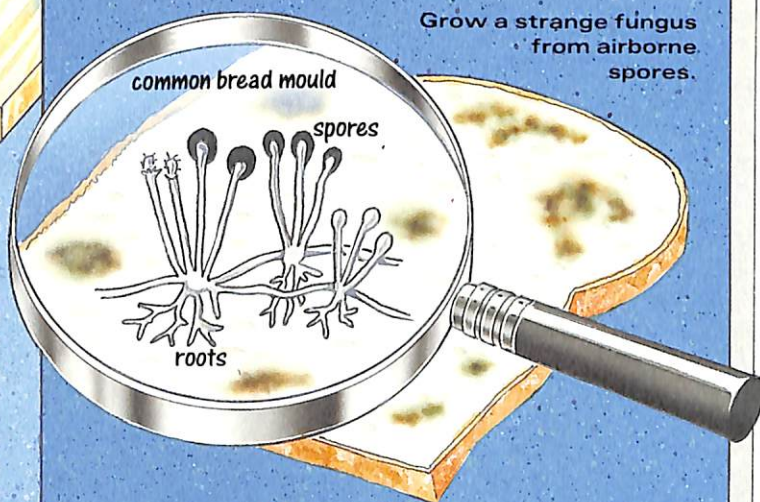
With this simple instrument, you can observe some of the miniature wonders of nature that usually go unnoticed, even in common insects and houseplants.

Obtain two small, low-power magnifying glasses; hold them about 15 cm apart, and look through them at some print in a book or newspaper. Vary the distance between the front lens and the print until you see a magnified, inverted (upside-down) image (1). If this proves impossible, alter the distance between the two lenses and try again. With simple lenses, the image will be distorted at very high degrees of magnification. So find a suitable separation that gives reasonable enlargement without too much distortion. Then cut a cardboard tube to this length (2), paint the inside with matt black paint, and tape the lenses to the ends of the tube. If the lenses are too small for the tube, they can be made to fit by mounting them in cardboard rings. Complete the construction as shown (3). To focus on an object, slide the tube up or down until the image is sharp.

GROWING BREAD MOULD

1 2 3 4 5

Grow a strange fungus from airborne spores.



The spores, or reproductive cells, of tiny plants called fungi float in the air and start to grow when they settle on moist substances such as food. To grow some mould, moisten a slice of bread. Then dab it on the kitchen floor so that it picks up some of the spores there. Then place the bread in a warm, dark place. After a few days, common bread mould and other fungi should appear.

THE GREENHOUSE EFFECT

1 2 3 4 5

The Earth is kept warm by heat trapped in the atmosphere. Observe this greenhouse effect on a smaller scale when growing seeds.



Put some moist soil in two seed trays and plant several kinds of flower seeds. Place a thermometer in each tray and then cover one tray with cling film. Place the trays outside, sheltered from rain, but exposed to the sun. Insert sticks to raise the cling film when the plants begin to grow taller. Note the temperature difference between the trays.

PROJECT INFORMATION

1 2 3 4 5

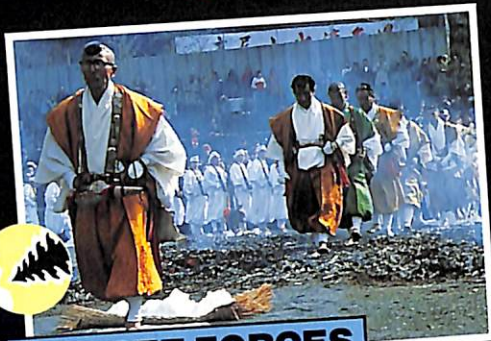
WARNING!

Each **QUEST** project has its own difficulty rating: 1 very simple, 2 simple, 3 intermediate, 4 advanced, 5 complicated.

Parents should ensure that experiments involving sharp tools, water and electricity are supervised. The publisher can accept no responsibility for injury.

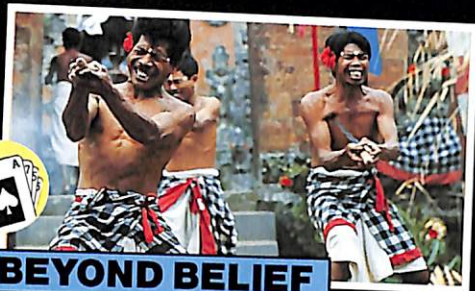
QUEST

THE SCIENCE OF MAGIC



SECRET FORCES

Fire-walking, the 'bed of nails', optical illusions – we explain the scientific facts that make the unbelievable possible.



BEYOND BELIEF

In the wrong hands, magical effects can be used for money, power and personal gain. Find out about the tricks of the fraud trade.



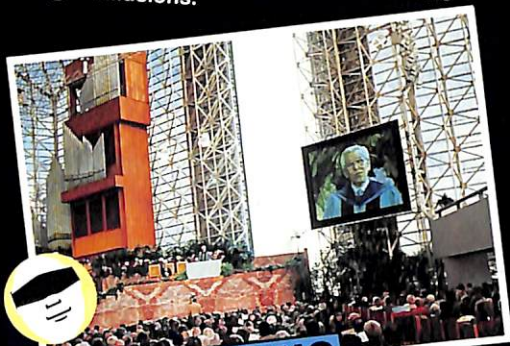
GREAT ILLUSIONS

What's the secret behind the Indian Rope Trick? How can a lady be sawn in half? Discover the techniques behind the classic magical illusions.



MOVIE MAGIC

Make-up, photographic tricks, electronic techniques, models, robotics – read how the experts create magic for the silver screen!



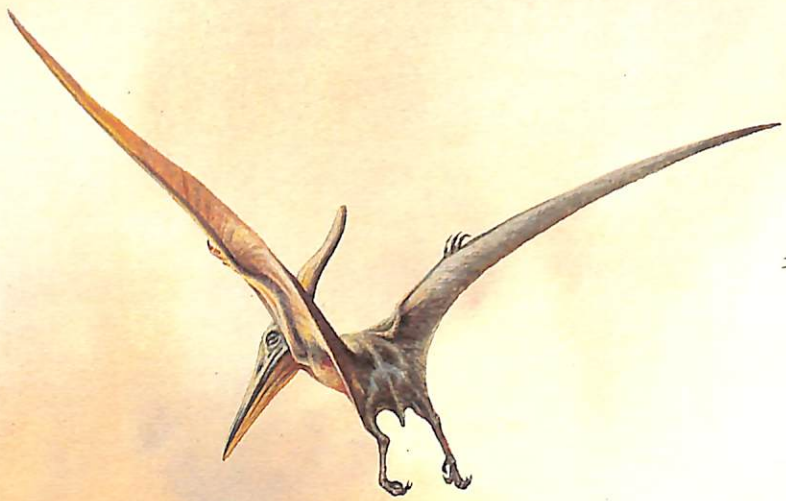
MINDBENDING

Can somebody read your mind? What lies behind the power of the hypnotist? How can millions be led astray? The answers are here.

PLUS! EXCITING EXTRAS!

The great magicians.
tricks • projects • brainteasers.
magic "betchas" • a giant
poster **AND** a magic
box to make!

AMAZING FUN FOR ALL THE FAMILY



Pterosaur (winged reptile)
The first flying reptile, with large leathery wings, clung to branches and rocky ledges like a bat.

SCA MONS

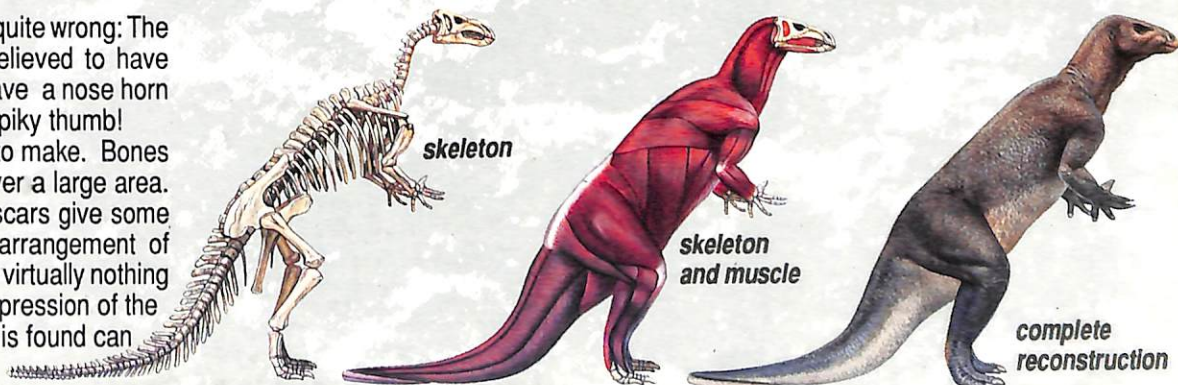


Ornithomimus (bird imitator)
An ostrich-like dinosaur which could run at 80 km/h

IGUANODON JIGSAW

Scientific guesswork can go quite wrong: The *Iguanodon* was originally believed to have walked on all fours and to have a nose horn - which turned out to be a spiky thumb!

Such mistakes are easy to make. Bones are often found scattered over a large area. Once pieced together, tiny scars give some clues as to the complete arrangement of muscles. Scientists still know virtually nothing about the skin. Only if an impression of the skin or a mummified animal is found can we guess how it looked.



PREY PREDATORS

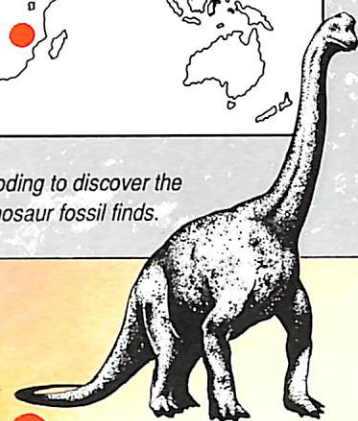
WHEN DINOSAURS RULED THE EARTH

PROFILES

Dead dinosaurs covered by sediment - sand, dust or mud - and weighed down by further layers, turned to stone. The Earth's heaving and buckling turned them up again, exposing the fossils.



Use the colour-coding to discover the main areas of dinosaur fossil finds.



Brachiosaurus (arm reptile)
One of the largest, this dinosaur was 25 metres long and stood 12 metres high. Its upper arm alone was over 2 metres long - longer than the hind legs - making the animal slope backward, rather like a giant, overweight giraffe.



Compsognathus (pretty jaw)
At a height of about 65 centimetres, Compsognathus was no larger than a hen, and one of the smallest dinosaurs ever found. A meat-eater, it probably had to prey on large insects.



Stegosaurus (roof reptile)
Two rows of bony plates ran down either side of its backbone, and the tail ended in two pairs of long, curved, bony spines. Its sides were, however, unprotected, which made this clumsy animal easy prey to meat-eaters.



Triceratops (three-horned face)
This peaceful giant had a large frill covering neck and shoulders to protect it from attack by meat-eaters and in wrestling matches with rival males. A plant-eater, it sliced leaves and twigs off with its sharp, hooked beak.



Tyrannosaurus (tyrant reptile)
The king of dinosaurs had a special wide-opening jaw which allowed it to swallow huge chunks of meat, and lines of sharp teeth for stabbing and slicing. Its strangely short forearms may have balanced its heavy body.

Corythosaurus (helmet reptile)
A duck-billed dinosaur which used its crest either to smell or to produce sound.

THE FIRST BIRD



Archaeopteryx

The skeleton (left) of the pigeon-sized Archaeopteryx was an exciting find. Like a bird, the animal had feathers (clearly imprinted on the rock), backward-pointing toes and a wishbone; yet it also had clawed fingers on its hands, a long bony tail and teeth in its jaw. Scientists had found proof of their theory that birds had



evolved from reptiles!

Archaeopteryx probably used its clawed wings for clambering up trees, caught insects with its wings and chewed with its many pointed teeth.